RAIS CLASSIC SERIES

USER'S MANUAL

RAIS 86
RAIS 4
RAIS 106

RAIS A/S
Industrivej 20
9900 Frederikshavn
Denmark
Tel.: +45 98 47 90 33
Fax: +45 98 47 92 91

Tested & Listed by: O-T-L C Beaverton Oregon USA

OMNI-Test Laboratories, Inc.

TABLE OF CONTENTS

INTRODUCTION 3

Safety and Environmental Testing 3
Features and Items Included 3

INSTALLATION 3

Precautions and Specifications 3
Specifications 5
Assembly Instructions 5
Chimney 6

OPERATING INSTRUCTIONS 7

First Fire 7
Building the Fire 8
Check for a Proper Burn 8
Cooking 9

FIREWOOD 9

Specifications 9
Burning value of wood 9
A Few Reminders 10

CARE AND MAINTENANCE 10

Creosote – Formation and Need for Removal 10
Surfaces 11
Glass Doors 11
Removing the Ashes 11
Cleaning the Smoke Box/Baffle System 12
Firebox Lining 12
Gaskets 12

TROUBLE SHOOTING 13

WARRANTY 13

Revision 1
October 12, 2006

Congratulations on your new RAIS wood burning stove. As a product of award winning design and superior quality, we wish you many years of warmth and pleasure.

INTRODUCTION

We are asking you to:

PLEASE READ THIS ENTIRE MANUAL BEFORE YOU INSTALL AND USE YOUR NEW RAIS STOVE. FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY, OR EVEN DEATH. KEEP IT HANDY FOR EASY REFERRAL.

Safety and Environmental Testing

The RAIS Classic Series stoves have been tested by OMNI-Test Laboratories, Inc. of Beaverton, Oregon and are listed to UL 1482 and ULC S627. They are EPA exempt as cook stoves.

Features and Items Included

Your RAIS has a built in convection system, so the sides do not get very hot. It also creates air circulation in the room, to spread the heat faster and more evenly.

The RAIS 4 and RAIS 106 models have unique sliding doors - a RAIS specialty, which enables you to operate them closed as a stove or open with a screen as a fireplace.

Included with the RAIS stove (in the firebox) are:

- Flue collar with 3 bolts/nuts (to connect to stove/pipe)
- An oven mitt and oven thermometer
- A box of RAIS starter matches
- Heat protective door handles
- Smoke plate hook (RAIS 4 and RAIS 106 only)
- A can of touch-up paint (**Remove from the stove!**)

Installation

Precautions and Specifications

IF THIS STOVE IS NOT INSTALLED PROPERLY, A HOME FIRE MAY RESULT. TO REDUCE THE RISK, PLEASE CAREFULLY FOLLOW THE DIRECTIONS FOR INSTALLATION.

Consult your local Building Inspector or Fire Marshall before installation to determine the need to obtain a permit. Also inquire about restrictions and installation inspection requirements in your area.

If utilizing an existing chimney, it is suggested that you have a professional mason or stove installer do a complete check-up of your chimney, liner, and flue.
In order for the stove to work and draw properly, sufficient air is important! Be especially aware of any mechanical fans (e.g. kitchen or bathroom) that may affect the proper draw.

In addition, make sure that the floor and sub-flooring is designed to carry the extra weight of the stove. The floor protector or plate must be made of a non-combustible material. It must cover under the stove and extend 16” (40.6cm) (18” (45.7cm) in Canada) in front of the stove door, 8” (20.3cm) beyond the sides of the door, and under the pipe and 2” (5cm) beyond for back venting.

When installing the stove, the heat distribution to other rooms should be taken into consideration. The approximate heating area (based on standard ceiling height) and thermal output are:

Model	Heating Capacity	Thermal Output Optimal*	(Range)
RAIS 86	969 ft² (90m²)	20,500 BTU (6 kW)	14-24 kBTU (4-7kW)
RAIS 4	1,076 ft² (100m²)	23,900 BTU (7 kW)	17-34 kBTU (5-10kW)
RAIS 106	1,292 ft² (120m²)	27,300 BTU (8 kW)	21- 41 kBTU (6-12kW)
*Minimum stove draft pressure at above output – 0.06” WC (16 Pascals)			

Specifications

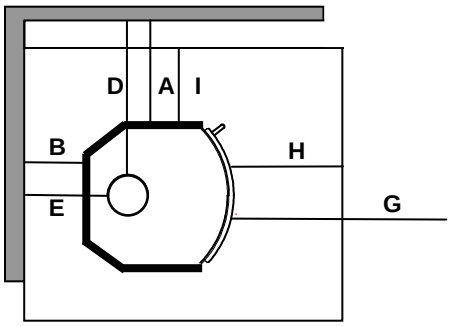
Single wall connector stove pipe – 6” (15cm) diameter
Chimney pipe – Class A, UL-103 HT, 6” (15cm) diameter

Efficiency – 71-73% based on DS standard

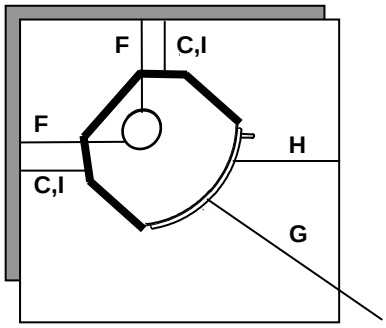
Minimum distance to non-combustible material – 2” (5cm)
Note: Non-combustible must be solid cement or block (not brick or tile over combustible material).

Minimum distances to combustible material – as shown:

Wall View



Corner View



#	Description	RAIS 86	RAIS 4	RAIS 106
A	Distance to combustible side wall	22” (56cm)	20.5” (52cm)	19” (48cm)
B	Distance to combustible back wall	9.5” (24cm)	8.5” (22cm)	11” (28cm)
C	Corner distance to side walls	15” (38cm)	14” (36cm)	11” (28cm)
		All Models		
D	Connector pipe to side wall	28.5” (72cm)		
E	Connector pipe to back wall	12.5” (32cm)		
F	Corner pipe to side walls	18.5” (47cm)		
G	Distance to furniture	36” (91cm)		
H	Front floor protection - US - Canada	16” (41cm) from door opening 18” (46cm)		
I	Side floor protection	8” (20cm) from door opening		
	Ceiling to top of stove	36” (91cm)		
	Ceiling to connector pipe	18” (46cm)		

Note: A heat shield or protective wall may be used to reduce clearances if it meets the NFPA requirements. Contact your local Building Inspector for proper guidelines.

Assembly Instructions

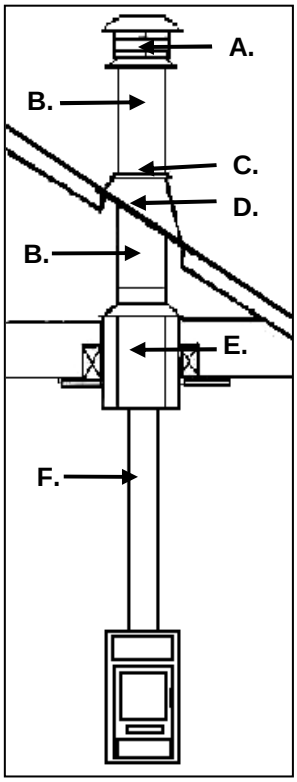
The Classic models all come assembled. To add the top plate on the RAIS 86, first check that the soapstone is in good condition. Place the 4 white spacers evenly and center the top plate. **CAUTION: Soapstone is fragile, so please handle with care.**

Mount the special RAIS collar using the included hardware. When installing the first piece of pipe (at the stove), place the pipe over the collar, which is designed so any moisture or creosote will drip back into the stove and burn away.

If using a crimped pipe, cut that section off at the bottom and place it over the collar. Install the remaining stovepipe segments with the crimped end down whenever possible.

Chimney

The RAIS stoves must be installed using a Class A UL 103 HT approved factory-built chimney system or a code-approved masonry chimney with a flue liner. In Canada, the installation must conform to CAN/CSA-B365.The chimney must extend through the roof at least 3' (1m), and 2' (.6m) above any structure within 10' (3m).



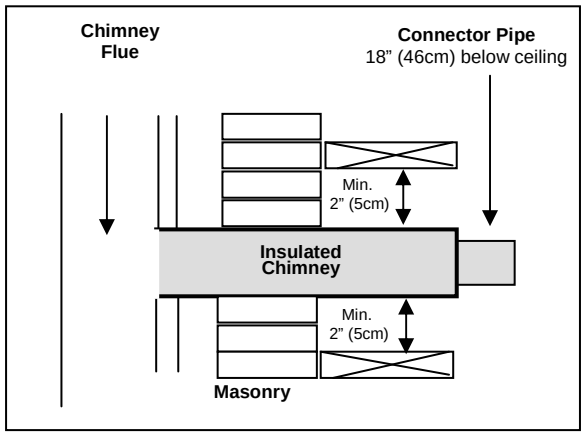
The condition of the chimney and height is very important. We suggest a total minimum height of 10' (3m). **Do not connect this stove to a chimney flue serving another appliance.**

Required Installation Components

A. Chimney Cap
B. Insulated Chimney
C. Storm Collar
D. Roof Flashing
E. Ceiling Support Box or Joist Shield/Firestop Spacer
F. Chimney Connector Pipe

For venting vertically into a Class A chimney, single wall pipe (at least 24 gauge) may be used in the room where the stove is installed. Refer to the manufacturer's instructions for the connection to the listed chimney. The chimney/stove pipe must not be smaller than 6" (15cm) in diameter.

For venting directly into a masonry chimney or through a thimble, the top of the single wall pipe must be at least 18" (46cm) below a combustible ceiling and conform to NFPA 211 guidelines and methods. See diagram below.



For rear venting or other not listed configurations, consult the local building codes and follow the NFPA 211 guidelines.

If the stovepipe is fitted with a baffle, it must be manually operated, visibly placed for ease of use, and must not close completely. Consult your chimney expert if you have any questions. **Important! Make sure that there is easy access to the chimney cleanout door.**

Operating instructions

First Fire

Your new RAIS should be broken in gently for top performance and to prevent paint damage, cracks in the firebrick, and excessive wear and tear.

Start with a small fire (**never overload the firebox**) to allow the materials to get accustomed to the higher temperatures, and then gradually increase the intensity. Use up to a maximum of 2 logs. **As a safety precaution when the fire heats up, use the protective door handles.**

For the first few fires you may detect a strange smell that comes from "heat treating" the paint and materials. This is normal and will soon disappear. Just insure there is plenty of fresh air in the room!

Furthermore, during the initial heating up and cooling down, some "click-sounds" may occur from the metals being exposed to the large differences in temperature. This is normal.

For wood to burn correctly, the right amount of air has to be supplied at the right time and places.

Primary air is defined as combustion air for burning the “mass of wood" and stimulates production of volatile gases.

Secondary air is used to burn off the gases at high temperatures (above 1,000℉ (540℃)) and to keep the glass free of soot.

Basically, the primary air is used to start the fire, and the secondary air is used to maintain the fire.

The RAIS 4 and RAIS 106 stoves are equipped with an air control handle on the left side just below the door. When the handle is pushed all the way right to **Position 1**, the primary air and secondary air are both fully open. When the handle is pushed left to the center to **Position 2**, the stove gets only the full secondary air, and if the handle is pushed to the far left toward Position 0, the air supply is reduced. At **Position 0**, the stove will shut down.

On the RAIS 86, the air controls are vents located on the front of the doors. Open both vents (to the right) for **Position 1**. Close the top vent to the left for **Position 2**, and **Position 0** is when both vents are closed.

The handle on the right side just below the door controls the shaker grate. It simplifies the cleaning of the stove. You just shake the ashes through the grate into the ash pan.

Refer to Removing the Ashes in the CARE AND MAINTENANCE Section of the Manual for detailed directions.

Firewood used should be seasoned, split wood with an adequate low degree of moisture (15 - 22%), and ideally about 12 - 14" (30 - 36cm) in length and for the RAIS 86, 10 - 12" (25 - 30cm). In order to get "dry wood", it should be stored in a dry place under a roof with sufficient fresh airflow for at least one full year for softer woods and a minimum of two years for hardwoods.

Only use the wood fuel as described in the FIREWOOD Section of this manual!

Building the Fire

To start the fire lay a few pieces of kindling or dry twigs and paper at the back of the firebox (enough for a small fire). **Build the wood directly on the stove hearth, and do not use a grate or elevate the fire.**

Set the air control to Position 1. On the RAIS 4 and RAIS 106, open the baffle plate (lift the handle on the right to a vertical position). Also, a smoke plate located at the top in the firebox can be pulled forward to help the smoke exit faster. Use the smoke plate hook to move and adjust the smoke plate. Light the fire, and during start up you can leave the door slightly cracked (with supervision) until the kindling is burning well.

Add 1 or 2 split logs on the kindling fire and allow enough time for them to catch on fire (about 2 - 5 minutes). Now close the door completely, and set the air control to Position 2.

Further adjustments to the air control may be made later on if necessary. **Never reduce the air intake to Position 0 while logs are still burning. This will cause incomplete combustion (creosote), risk of explosion, and soot on the glass.** Once the door is closed and burning correctly, the stove does not require supervision. Adjust the baffle plate to horizontal and push back the smoke plate.

The RAIS Classic Series was developed to an optimal thermal output of 20,500-27,300 BTU/hr (6-8 kW) with a water content of 18%, which corresponds to **about 4-4½ lbs wood/hour**. If the fire is fed more than recommended, there is a danger that the stove will be overloaded and might discolor. **Over firing is unnecessary and will void the warranty.**

Check for a Proper Burn

For a proper burn, the inside of the firebox and the glass panel should be free of soot, and the ashes in the bottom should be light gray (not black). To allow more air in to the heating chamber, open up the air controls (handle/vents to the right).
For normal operation the air control should be set at Position 2. However, if the wood is burning too quickly, you can adjust the air control (handle/vents toward the left).

To ensure a proper and safe combustion, there should be bright and lasting flames/embers. Don't let the wood smolder. Do not close the air inlets completely during normal usage.

The RAIS 4 and RAIS 106 can also be burned as a fireplace with the doors open. For safety, keep the screen on the fireplace opening at all times.

Cooking

You can both cook and bake in your RAIS stove. Learning how to control the oven heat in a wood stove is a matter of trial and error. Your RAIS stove comes with an oven thermometer, which helps in the learning process.

For most baking needs, bring the temperature up to 300-400℉ (150-200℃). If the oven temperature gets too high (above 425℉ (220℃)), op en up the oven door for a few minutes.

Always protect the soapstone liner with foil. Frozen dishes such as pizzas can be put directly in the preheated oven without first defrosting.

A grill rack is available for the RAIS 4 and RAIS 106 for grilling in the firebox. Open the baffle plate and doors to grill, and supervise at all times.

The top portion directly above the oven can serve as a warming area for plates or coffee, or even for rising dough.

Each cook will discover what works best for his or her particular stove. Bon Appetit!

Firewood

Specifications

Only burn wood that has been seasoned for at least one full year (2 years is best!). If the wood has not been "seasoned" or dried, much of the energy of the fire will go into evaporating the water. Furthermore, condensation or creosote might occur in the stove and pipe if you burn moist wood.

The log size should be about 2” (5cm) less than the width of the firebox.

Burning value of wood

Air-dried wood has less moisture (15 - 20%) than freshly cut timber (40%+), and typically yields 20% more available heat. Wet wood burns at a lower temperature and causes incomplete combustion (soot and "creosote" formation, which in extreme cases, can lead to a chimney fire).

All types of wood heat up equally per pound (kilogram); however, the density of wood is not the same, as shown in the following table:

Type of wood	*Dry Wood - Lbs/ft³ (Kg/m³)*	*Compared to beech*
Beech and Oak	36.2 (580)	100%
Ash	35.6 (570)	98%
Maple	33.7 (540)	93%
Birch	31.8 (510)	88%
Mountain pine	30.0 (480)	83%
Fir	24.3 (390)	67%
Poplar	23.7 (380)	65%

A Few Reminders

- Store your wood cut and split (split logs dry faster).
- Keep the woodpile in a dry sunny place, protected from the rain. Don't cover the pile with plastic, because that will prevent the wood from drying out properly.
- Stack the wood with enough space between the rows to ensure good air circulation!

Fuel Caution

Do not burn trash (plastics and other trash emit harmful gases), driftwood, treated wood, artificial logs, or non-seasoned wood.

Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, naphtha, engine oil, or similar liquids to start or "freshen up" a fire in this heater. Keep all such liquids well away from the heater while it is in use.

CARE AND MAINTENANCE

Although your RAIS stove requires little day-to-day upkeep, it is important to maintain it for your safety and enjoyment.

IMPORTANT:

YOU SHOULD HAVE YOUR CHIMNEY AND STOVE CHECKED ONCE EVERY 2 MONTHS DURING THE HEATING SEASON OR AT LEAST ONCE A YEAR BY A PROFESSIONAL CHIMNEY SWEEP AND CLEANED AS NEEDED.

Creosote – Formation and Need for Removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire.

The chimney connector and chimney should be inspected once every two months during the heating season to determine if a creosote buildup has occurred.

If creosote has accumulated it should be removed to reduce the risk of a chimney fire.

Surfaces

The outer surfaces can be wiped with a dry soft rag, and if needed, a small amount of mild detergent, but try not to scrub!

Minor scratches and other surface damage can easily be touched up with the RAIS paint supplied with each stove. Remove any dirt, tar, and rust, and make sure repairs are made only when the stove is cool (room temperature).

Soapstone stains can be cleaned with alcohol or it can be lightly sanded.

Glass Doors

The glass can be easily cleaned by wiping with a damp rag dipped in some of the ashes. A good commercial glass cleaner can also be used.

If the glass should break, carefully remove the door/s. On the RAIS 86, lift it off the hinges, and on the RAIS 4 and RAIS 106 remove/save the locking pins and slide the doors back and out. Use a long nose punch (size 5/32 flat head) to gently tap out the locking pins located at the sides on the band above the doors.

Place and steady the doors on a flat clean surface.

Remove the 4 screws from the back, and gently take out the inner frame assembly. Then, remove all the loose pieces of glass and replace only with a 4mm ceramic new glass panel and gasket available from an authorized RAIS dealer.

Assemble the inner frame, tighten the screws evenly (star formation), replace the door/s, and gently tap the locking pins from the outside on the stove for the RAIS 4 and RAIS 106.

Removing the Ashes

Start by cleaning out the firebox. Use the shaker grate to remove the ashes through the grate. A tray is in the ash drawer beneath the firebox.

Remember to leave some of the ashes in the firebox (about a 2”/5cm layer) for better insulation! Be sure to put the tray back in the ash drawer, since it also serves as a reflection shield.

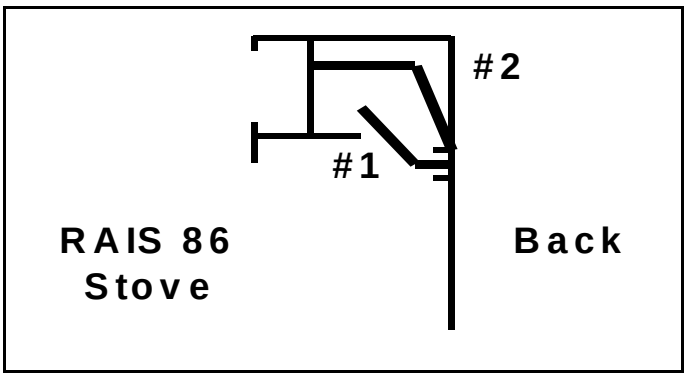
DISPOSAL OF ASHES:

ASHES SHOULD BE PLACED IN A METAL CONTAINER WITH A TIGHT FITTING LID. THE CLOSED CONTAINER OF ASHES SHOULD BE PLACED ON A NONCOMBUSTIBLE FLOOR OR ON THE GROUND, WELL AWAY FROM ALL COMBUSTIBLE MATERIALS, PENDING FINAL DISPOSAL.

IF THE ASHES ARE DISPOSED OF BY BURIAL IN SOIL OR OTHERWISE LOCALLY DISPERSED, THEY SHOULD BE RETAINED IN THE CLOSED CONTAINER UNTIL ALL CINDERS HAVE THOROUGHLY COOLED.

Cleaning the Smoke Box/Baffle System

1. Remove the two baffle plates on the RAIS 86 as follows:
   a. Lift out the smaller plate near the back first (#1), and then the larger baffle plate on top (#2). See the view below:



2. Remove the smoke plate on the RAIS 4 and RAIS 106 as follows:
   a. RAIS 4 – Raise the smoke plate up, turn it at a 90° angle (vertical), and pull it out through the door opening.
   b. RAIS 106 – First unscrew the two bolts on the sides holding the brackets, and hold on to the smoke plate. Lift the smoke plate up, turn it at a 90° angle (vertical), and pull it out through the door opening.

3. Use a small brush or rag to clean out the smoke box and vacuum if necessary.

4. The baffle and smoke plates can now be put back, and make sure they are properly put back in place.

Firebox Lining

The firebox lining (bottom and sides) is made out of firebrick, which protects the outer steel plates from overheating. With time small cracks might appear, and this is normal. If it breaks however, it must be replaced.

Gaskets

It is recommended to replace the door gaskets about every 2 years. When replacing the door gasket, make sure the door glass is not pressed too hard against the gasket. The gasket around the ash drawer can also be replaced as needed. Gaskets can be obtained from an authorized RAIS dealer.

Trouble shooting

Problem	Possible Cause/Solution
Smoke coming out of the door	There may not be enough draft in the chimney (<0.06” WC (<16 Pascals)). Check for an obstruction.
Soot on the glass	Take care that the stove is warmed up sufficiently before closing the door.
The stove is burning too quickly	Check the door gaskets first and replace if needed. The chimney could also be too high and thus create too much draft (>0.09” WC (>22 Pascals)). A damper may be needed.
The stove is burning too slowly	It could be due to too little air getting to the stove. Check that you're not running exhaust fans (kitchen/bath), the chimney is not blocked, or there is a leak between the chimney, the stovepipe, and the stove.

If the problem continues or other conditions, we recommend that you contact your chimney sweep or your dealer.

If you should experience a chimney fire, quickly close all doors, dampers, vents, and call you local fire department. **Don't use water** to extinguish the fire.

Warranty

We offer a 5-year warranty on your RAIS stove, which covers any defect in material or workmanship. It does not cover damage from misuse or neglect. The glass, gaskets, and firebrick are not covered.

ENJOY YOUR NEW RAIS!